

Abstract

Digital computational circuit comprising a network made of a plurality of identical repetitive DNA-based conductive elements. The DNA-based elements used for the purposes of the invention employ a P-bridge as a tunnel junction for a net charge. The DNA-based element of which the circuit is made may be a DNA SET transistor. The circuit may comprise a DNA resistor built from a plurality of SET transistor elements in series, with a constant over-threshold gate voltage. The circuit may further comprise NOT and NOR gates. The NOT gate can be made of a DNA-based transistor and a resistor, and the resistor can be made by using a DNA SET transistor with a constant over-threshold gate voltage, and by placing a plurality of such DNA SET transistors in series until the resistivity reaches the desired value. The NOR gate, on the other hand, can be built from two NOT elements wherein the output of the first NOT element is connected to the resistor of the second NOT element as its voltage supply.

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